SCOPE

MAGAZINE OF NAVY M[illegible]E RESEARCH AND DEVE[illegible]MENT

WINTER 2025

NHRC COPE: HELPING LEADERS EVALUATE COMMAND CLIMATE

Meet the Civilian Research Team Working Towards Force Wellness

SCOPE

MAGAZINE OF NAVY MEDICINE RESEARCH AND DEVELOPMENT

ISSUE 7 WINTER 2025

Editor's Desk

Bienvenido to THE SCOPE! Whether you have been a longtime reader or are just joining us, we hope you had a great 2024 and are looking forward to R&D in 2025.

NMR&D spent the fall and early winter attending conferences, collaborating across academic institutions, and strengthening host nation ties through research and partnerships. Special thanks to CMC for letting me tag along to Navy Week Kansas City; it was an amazing opportunity to represent Navy Medicine and the Hospital Corps (Corpsman Up!). As you will see in my blog, Kansas City now holds a special place in my heart.

As we look forward to the changes the Spring has in store, please enjoy the latest stories of the hard work and dedication of our NMR&D commands.

—HM2 Alejandra Ramirez Alarcón

THE SCOPE

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In this issue:

NMR&D at ASTMH 2024

R&D Shows up strong to annual conference

NHRC COPE

Naval Health Research Center's team of experts strive to safeguard the wellness and behavioral health of service members

Navy Week Kansas City

HM2 Alejandra Ramirez Alarcon travels west to take in the sights and spread the word on Navy Medicine Research & Development

NAMRU DAYTON Lab Leaders

The Directors for EHEL and NAMRL sit down for a Q&A with NMRC Public Affairs

On the Cover:

NHRC's Rapid Response Surveillance (RSS) team. Photo by Danielle Cazarez

Tommy Lamkin

Navy Medicine COVID-19 Findings Published in Lancet; Featured on Podcast

By Mike Wilson

Long-term SARS-CoV-2 findings from Naval Medical Research Command's (NMRC) COVID-19 Health Action for Marines (CHARM) 2.0 study were published in the Lancet Regional Health – Americas on October 24th.

The CHARM 2.0 study was designed to follow Marines originally enrolled in a prospective cohort study during the height of the pandemic to characterize the risk and presentation of long-term health outcomes following COVID-19.

The study found that a quarter of those Marines who were either asymptomatic or had mild acute COVID-19 reported long-term effects of infection. Those affected with Post Acute Symptoms of COVID (PASC), showed evidence of long-term decrease in functional performance suggesting that SARS-CoV-2 infection may negatively affect health for a significant proportion of young adults.

"This study highlights the need to continue studying how COVID-19 may affect our military personnel long term"

CHARM 2.0 is a collaborative effort between NMRC, fellow Navy Medicine Research units, such as Naval Medical Research Units (NAMRU) INDO PACIFIC and SOUTH and the Icahn School of Medicine at Mount Sinai.

"This study highlights the need to continue studying how COVID-19 may affect our military personnel long term," said Dr. Chad Porter, the principal investigator on the study.

Continued on page 35

Greta Ruffino

NAMRU EURAFCENT XO Named 2024 Navy Optometrist of the Year

By Greta Ruffino

Cmdr. Micah Kinney, executive officer, Naval Medical Research Unit (NAMRU) EURAFCENT, was named the 2024 Navy Optometrist of the Year during the Armed Forces Optometric Society (AFOS) November 5th ceremony in Indianapolis, Indiana.

AFOS Optometrist of the Year award recognizes significant contributions to the advancement of AFOS and optometry across federal service.

"Cmdr. Kinney's background in providing clinical care to keep Navy personnel 'in the fight,' combined with his insights and experience on how operationally focused research helps to provide a competitive advantage to U.S. forces make him a great addition to the team," said Capt. Virginia Blackman, commanding officer, NAMRU EURAFCENT. "I appreciate his leadership and fresh perspective as we build on our past successes and strengthen our foundations."

Kinney, a fellow of the American Academy of Optometry reported to NAMRU EURAFCENT's Sigonella-based headquarters in June 2024.

"I am humbled and honored to have been selected as this year's Navy optometrist of the year," said Kinney. "These awards not only recognize an individual, but the team and support system around that individual. I share this honor with my colleagues and partners who have helped improve warfighter protections and visual performance."

This is not the first time that AFOS has recognized Kinney. In 2018, he received the Navy Junior Optometrist of the Year award.

"Optometrists provide 'sight for the fight' and work as key partners within the Military Health System to keep our military performing at their peak. I am proud to be a Navy Optometrist and for the work that AFOS does to forward our profession not only in the military but across all federal services," Kinney added. ■

Emily Swedlund

NSMRL's ND1 John Ahnen Selected for Serviceperson of the Month

By Emily Swedlund

Navy Diver 1st Class John Ahnen of Naval Submarine Medical Research Laboratory (NSMRL) was selected as November's Serviceperson of the Month by the Chamber of Commerce of Eastern Connecticut.

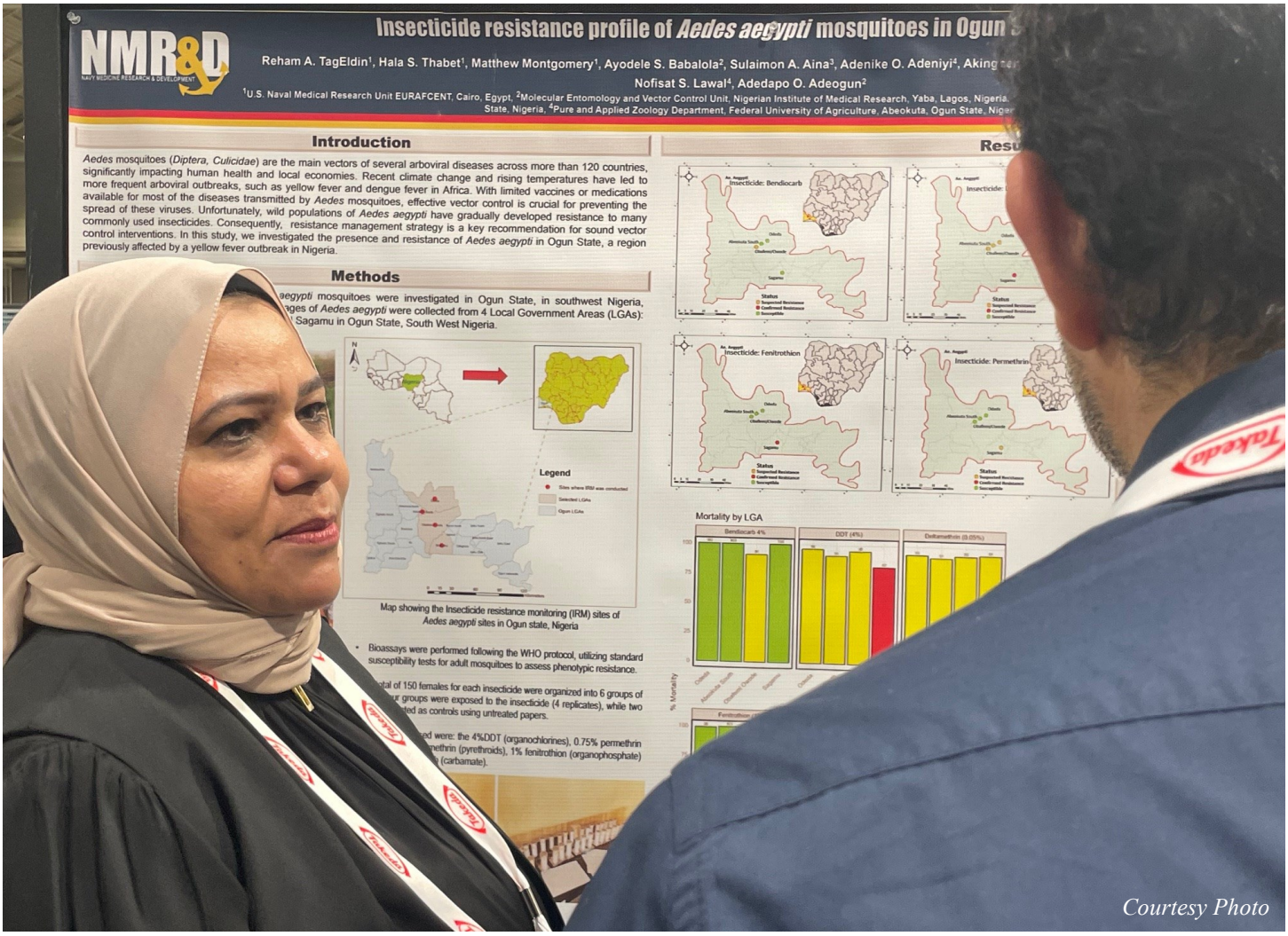
Ahnen, who originally hails from Orlando, Florida, was recognized for his work as the leading petty officer and dive supervisor for the NSMRL dive department, where he leads a 10-person team comprised of active-duty Sailors, civilians, and contractors. Under Ahnen's supervision, NSMRL's recompression chamber was recertified after years of renovations, reestablishing hyperbaric research capabilities within Navy Medicine for the first time in seven years.

The community-sponsored Serviceperson of the Month program recognizes outstanding active-duty enlisted personnel who are stationed in the New London/Groton area and who have made noteworthy community service contributions while excelling in their military duties.

"He is a tireless worker who cares greatly for his Navy team and his community"

"I have known Petty Officer Ahnen for many years now and can attest to his dedication to the Navy and southeastern Connecticut," said Lou Deflice, department head for diving operations at NSMRL. "He is a tireless worker who cares greatly for his Navy team and, and for his community."

Continued on page 35



Courtesy Photo

NMR&D Attends 2024 ASTMH Annual Meeting in New Orleans

By Mike Wilson

Navy Medicine Research & Development (NMR&D) attended the American Society of Tropical Medicine & Hygiene (ASTMH) Annual Meeting from November 13th to 17th, held in New Orleans.

This year's ASTMH theme was Advancing Science, Building Community Together. NMR&D participants included officer and civilian scientists from Naval Medical Research Command (NMRC) and Naval Medical Research Units (NAMRU) EURAFCENT, INDO PACIFIC and SOUTH.

"ASTMH is the premier conference for researchers investigating infectious diseases and global health with attendees that travel to this meeting from around the world"

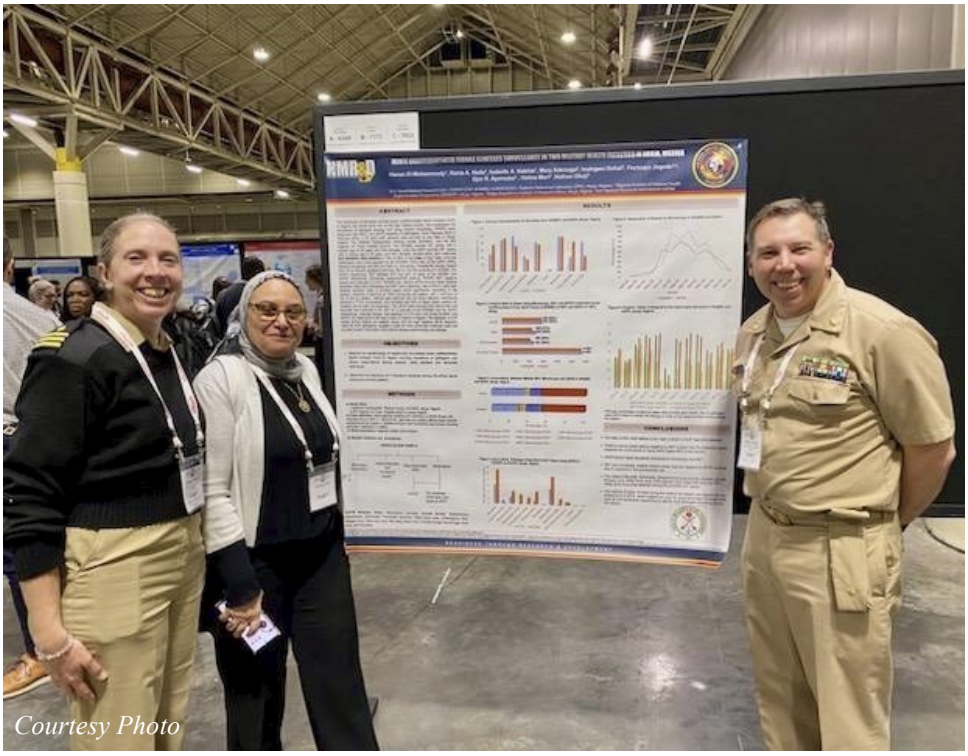
"The American Society for Tropical Medicine and Hygiene Annual Meeting is the premier conference for researchers investigating infectious diseases and global health with attendees that travel to this meeting from around the world," said Cmdr. Mark Simons, NMR&D deputy science director.

Throughout the five-day meeting, military and civilian staff with the NMR&D presented on surveillance and research work to fellow stakeholders in tropical disease medicine during breakout and poster sessions.

"Leveraging this meeting and the combined expertise of its attendees benefits the Navy with improved knowledge and awareness of infectious disease threats and by expediting the development of medical countermeasures to enhance the readiness and operational effectiveness of Sailors and Marines"

Courtesy Photo

"This is the one time each year where leaders and scientists from across the global network of Navy research laboratories can meet with their counterparts from other regions of the world to share knowledge, trends, best practices, ideas, and foster collaborations," Simons added. "It also provides an opportunity for Navy researchers to meet with partners from other services, interagency and other government partners, non-government organizations, and academic researchers to share their goals and develop strategies to mitigate the threat of infectious diseases on human populations. Leveraging this meeting and the combined expertise of its attendees benefits the Navy with improved knowledge and awareness of infectious disease threats and by expediting the development of medical countermeasures to enhance the readiness and operational effectiveness of Sailors and Marines."


Courtesy Photo

Work presented by NMR&D researchers at the annual meeting include research into vaccine development, disease detection and surveillance of diseases like dengue and malaria. The information shared allows the enterprise and fellow medical research stakeholders to better develop health solutions worldwide.

ASTMH, founded in 1903, is an international scientific organization focused on reducing the worldwide burden of tropical infectious diseases and improving global health. The ASTMH Annual Meeting brings tropical medicine and global health professionals from multiple organizations together to a forum for the exchange of scientific advances in tropical medicine and hygiene.■

Tommy Lamkin

Infectious Disease Consequences and Mitigation:
NMRC Commander Discusses Outbreaks, Future Collaborations, During Visit to Notre Dame

By Sidney Hinds

Capt. Franca Jones, commander, Naval Medical Research Command (NMRC), met with scientists and directors during a visit to the University of Notre Dame on October 9 to discuss ongoing command work and future collaborations.

Jones visited with Notre Dame experts in infectious disease, vaccine development and biomedical applications to identify areas for NMRC and the university to work together on future research ventures.

"The Eck Institute for Global Health was honored to organize and host NMRC leadership's first visit to Notre Dame"

"The Eck Institute for Global Health was honored to organize and host NMRC leadership's first visit to Notre Dame," said Tim Weber, associate director of the Institute. "The University of Notre Dame and the Department of the Navy have a proud tradition of working together in many research areas. NMRC's visit was an excellent opportunity to bring two world-class research organizations together to tackle important global health problems while improving the health and readiness of our country's Sailors and Marines."

Courtesy Photo

Jones also spoke on the impact of infectious disease on global health and U.S. military readiness during a presentation to undergraduate and graduate students. Military readiness in response to infectious disease outbreaks requires constant efforts on the part of research and development organizations. Illness caused by infectious diseases, which can spread rapidly in close-quarters, such as those found in the shipboard environment, can take service members out of their roles for prolonged periods of time, negatively effecting the military's capabilities.

Jones, who joined the U.S. Navy as a microbiologist in 2001, highlighted the role of organizations within the U.S. Navy, such as Navy Medicine Research and Development (NMR&D), in effectively identifying and curbing the negative effects of infectious disease outbreaks.

"It is critical that NMR&D collaborate with scientists in academia and industry to achieve our goal to ensure warfighter readiness," Jones observed. "In particular, our collaboration with Notre Dame on bio surveillance will ensure that our warfighters and the medical providers who take care of them understand the infectious disease threats that may impact readiness.

"Expanding on this partnership with Notre Dame to areas such as wound care, drug and diagnostic development, and detection of environmental exposures may serve to improve warfighter readiness in the future," Jones added.

"It is critical that NMR&D collaborate with scientists in academia and industry to achieve our goal to ensure warfighter readiness"

Jones also discussed the negative impacts of infectious disease outbreaks on global health. Infectious diseases impact the health security of our nation and other nations by increasing morbidity and mortality and destabilizing health infrastructure.

Outbreaks of infectious disease can also cause, directly or indirectly, contamination of food and water. These contaminations can cause additional sickness and erode confidence in food security. Infectious disease impacts on workers in the food production and transportation industries can further erode food security on a national scale, in addition to broader consequences for the economy and individuals' job security, as demonstrated by the COVID-19 pandemic, which resulted in closing borders, closing stores and layoffs, among other outcomes.

Jones' presentation was part of the Eck Institute for Global Health's Global Health Colloquium, a recurring program of speakers in the health sciences who address topics relevant to global health. ■

Courtesy Photo

Burrell Parmer

NAMRU San Antonio talks NanoParticles at 10th Mission Possible

By Burrell Parmer

Leadership, research scientists, and support staff of Naval Medical Research Unit (NAMRU) San Antonio attended the 10th Edition of Mission Possible, an information-sharing event, held at the Tri-Service Research Laboratory.

The purpose of Mission Possible is to better inform members of the command on the tactics, techniques and procedures of the science directorates, to include the NAMRU's resource acquisitions and administrative directorates.

This iteration of Mission Possible focused on "perspective" and how disruptive technologies are providing views of a previously unseeable world, opening windows of opportunity for military scientists to conduct extraordinary experiments that produce tools and technologies giving overmatch to warfighters.

Dr. Sakhrat Khizroev, a Victor Clarke Endowed Chair Professor of Electrical and Computer Engineering at the University of Miami, was invited, via video conference, to present on research concerning the use of MagnetoElectric NanoParticles (MENPs) for revolutionizing medical applications.

"The MENPs created by Dr. Khizroev are one of those disruptive technologies that untethers the imagination, providing an incredible opportunity to listen to the individual cells of the brain as they do their bidding without disturbing, influencing, or estimating their actions," said Dr. Darrin Frye, NAMRU San Antonio's chief science director, who invited Khizroev to speak.

After the presentation, research scientists were afforded the opportunity to ask questions regarding Khizroev's research. ■

Courtesy Photo

NAMRU EURAFCENT Engages Local Ghanaian Partners on Liquid Nitrogen Plant Operation

By Lt. Cmdr. Robert Hontz

Naval Medical Research Unit (NAMRU) EURAFCENT active-duty and civilian staff members facilitated training for Ghana Armed Forces (GAF) engineers and other civilian biomedical technicians in the operation, basic maintenance and troubleshooting of a liquid nitrogen production facility on the GAF 37 Military Hospital campus from October 28 to November 1.

The facility, originally located in Sierra Leone and used during the West African Ebola outbreak of 2014-2015, aided the collection, storage and testing of suspected Ebola-positive samples. Following the outbreak, NAMRU EURAFCENT acquired the facility as part of the Joint West Africa Research Group and transferred ownership to the GAF in Accra in 2017. Due to resources and training limitations during the COVID-19 pandemic, the facility had not been previously utilized fully to support clinical and laboratory operations. Marian Mikhail, a biomedical engineer with NAMRU EURAFCENT's Cairo detachment and Hospital Corpsman 1st Class Kirk Young, a biomedical equipment technician, with the command's Sicily-based headquarters, worked alongside Sterling Cryogenics' technical expert to provide hands-on and lecture style training on the operation, basic maintenance and troubleshooting for the nitrogen plant. Five members of the GAF engineering corps, both uniformed and civilian, along with the head of biomedical maintenance at the Noguchi Memorial Institute for Medical Research (Noguchi), participated in the week's activities.

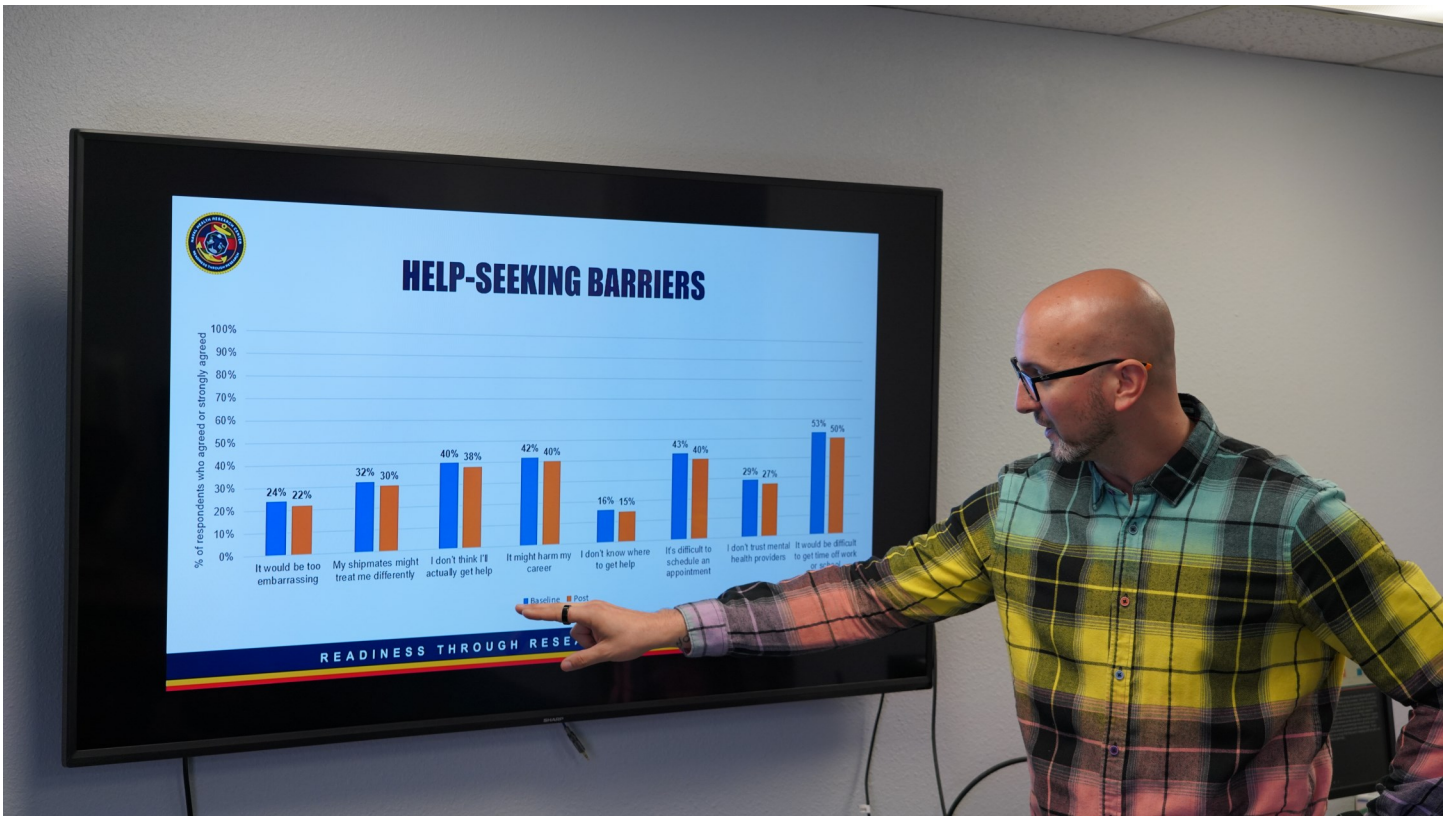
"A functioning liquid nitrogen plant will give the Ghana Armed Forces and Noguchi unique capabilities locally and regionally," explained Lt. Cmdr. Robert Hontz, NAMRU EURAFCENT Ghana Detachment director. "Availability of liquid nitrogen in this part of the world is rare, and thus, very expensive when procured from corporations. With this staff training and continued successful operation of this plant, NAMRU EURAFCENT has facilitated a new and unique capability, and potential cost-cutting measure, for our African partners."

In the upcoming months, NAMRU EURAFCENT staff and GAF engineers plan to develop procedures for the operation and maintenance of the plant, and to create a joint agreement on how the plant will be regularly run and maintained. ■

NHRC HELPING LEADERS EVALUATE COMMAND CLIMATE:

Meet the Civilian Research Team Working Towards Force Wellness

Story: John Marciano
Photos: Danielle Cazarez



When a Navy ship or shore command is at risk or experiences adverse safety events, leaders need clear information about vulnerabilities that exist, who is most at risk and why, and what actions can be taken to prevent future incidents. Understanding how leadership, workplace cohesion and stressors influence and affect sailors' mental and behavioral health is crucial for developing meaningful solutions to these issues.

Civilian investigators at Naval Health Research Center developed the Rapid Response Surveillance (RRS) capability to assess these factors quickly and provide practical recommendations to Navy leaders. The multidisciplinary team is made up of researchers with expertise in psychology, public health, mixed-methods research and epidemiology, and can deploy when a command experiences an adverse event or mishap, such as suicide, or when a command is at a heightened risk for such events.

"I think the fact that we are civilian researchers is very helpful because we don't report to their chain of command"

After RRS has been requested by a command and funding is secured, the team schedules a one-week visit to conduct an anonymous and voluntary command survey as well as in-depth focus groups. The team may screen for depression, suicidal ideation, anxiety and posttraumatic stress symptoms. They ask about alcohol use, sleep habits and aggressive behavior, and assess participant's perceptions of leadership, workplace cohesion and stressors.

While it can be challenging to recruit enough Sailors to make the study worthwhile, the team provides incentives to participate, and works to establish trust with the participants.

"I think the fact that we are civilian researchers is very helpful because we don't report to their chain of command," said Robyn Englert, the RRS team study coordinator.

Once data collection is complete, the RRS team works quickly to analyze their findings. They take extra care to review what they have learned and develop recommendations that can be readily implemented without interfering with the command's mission.

Findings are presented to command leadership, and infographics, handouts and summaries are distributed to relevant departments.

"All of the data we collect is for the purpose of trying to make realistic, specific and actionable recommendations that the command can implement to make the experiences of Sailors better," said Dr. Jennifer Belding, who was principal investigator of RRS from 2023-2024.

All of the data we collect is for the purpose of trying to make realistic, specific and actionable recommendations that the command can implement to make the experiences of Sailors better"

What sorts of recommendations are made? Consider a hypothetical scenario where junior enlisted personnel face significant stress due to last-minute task assignments every Friday. Perhaps these tasks are communicated with short notice, leaving them scrambling to complete their duties by the end of the day. The RRS team may dig deeper and learn that these issues are due to chiefs receiving task information on Wednesday but then being unable to relay those assignments until Friday due to their own meeting schedules. One actionable recommendation may be to move the chiefs' meetings earlier to Monday,

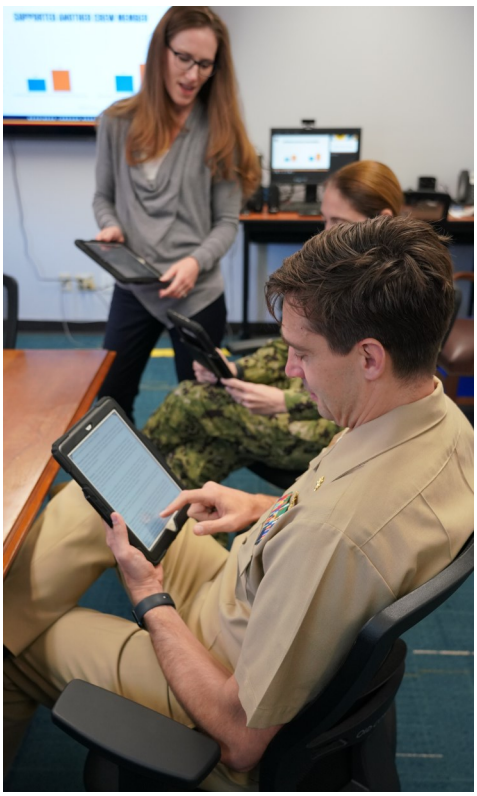
thus allowing for earlier communication and providing junior enlisted members additional time to complete their tasks. This change could hypothetically reduce work-related stress and lead to positive outcomes.

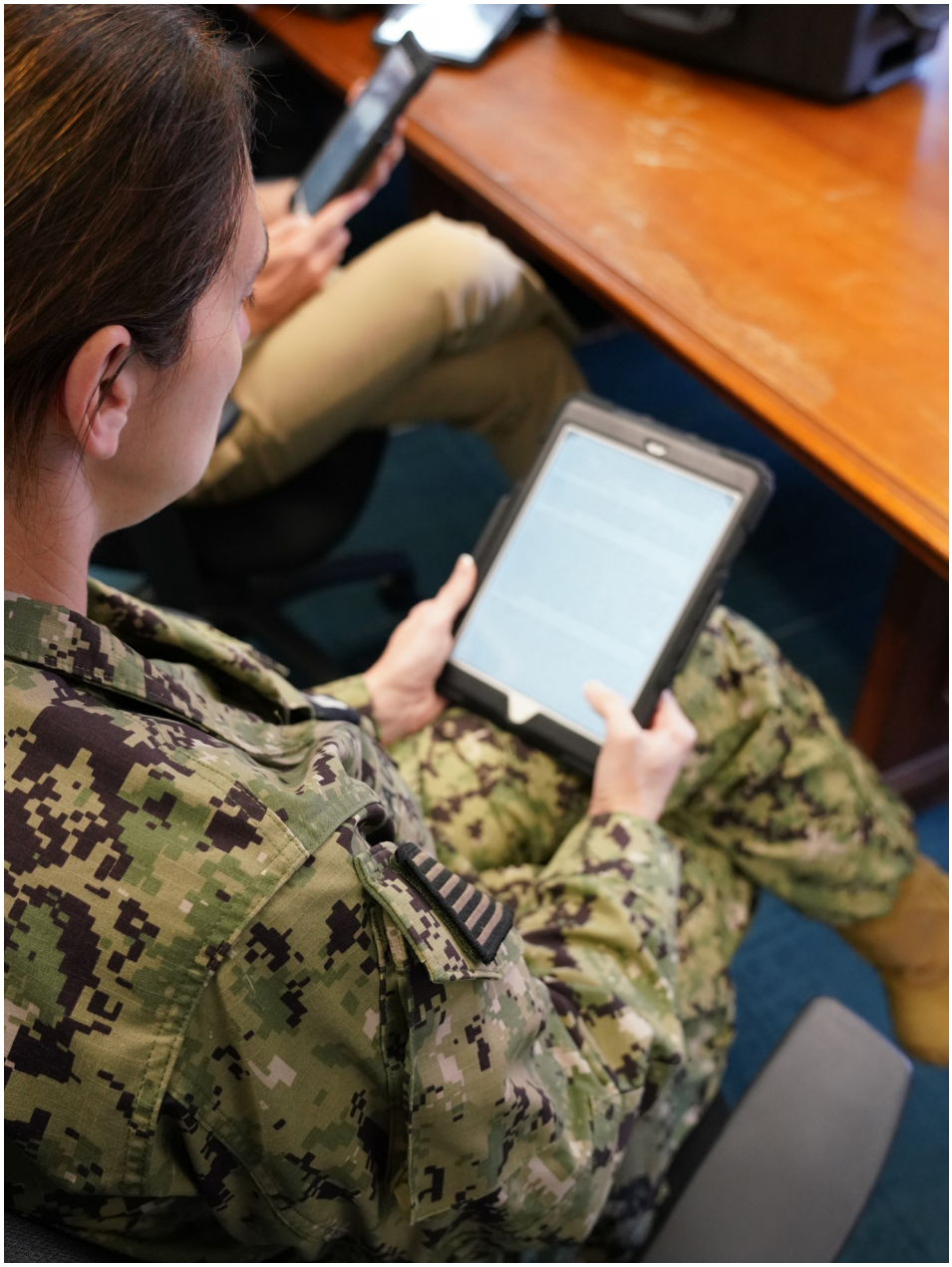
"It's little changes to leadership style, schedules or making a tweak here or there in order to ease stressors that commonly can get overlooked," explained Englert.

The RRS capability spawned from a similar effort the team was conducting called the Challenges of Operational Environments (COPE) study. While similar in design and approach, COPE is unique from RRS in that it seeks to understand how work-related stressors impact the mental and behavioral health of sailors throughout the different phases of a command's life cycle.

"We know that Navy commands go through different phases or life cycles. For example, a carrier might be stationed in the U.S. for a while, deploy, then change homeports, then visit the shipyard for repairs. We do not currently have data about how these changes impact sailors' well-being," said Belding.

By identifying which stressors are associated with harmful behaviors at specific times, the team can provide commands with crucial information, allowing leaders to anticipate common stressors, potentially preventing issues like suicidal ideation, aggressive workplace behaviors and hazardous drinking. The goal is to help commands offer targeted resources and support, promoting self-care and overall well-being among their personnel.





The COPE project stalled when COVID-19 halted travel and fieldwork; however, it gained new life when a ship experiencing adverse events requested assistance. Despite initial travel restrictions, the team eventually conducted a rapid response assessment, administering surveys and conducting focus groups. They briefed the ship's command on their findings within six weeks, which marked the birth of the RRS capability. The swift assessment and feedback proved invaluable, and word began to spread about this unique capability.

Over the past year, RRS has supported five commands, four of which have requested the team conduct a reassessment as well. Even better, command leaders are sharing their experiences with other commands who might need support.

"The way that people are getting information about this capability is through word of mouth because of positive experiences," said Belding. "I think that is a success story."

"The way that people are getting information about this capability is through word of mouth because of positive experiences"

The COPE study will continue to observe personnel aboard two aircraft carriers over a two- to three-year period. The data collected will be used to develop a predictive model of harmful behaviors among sailors over various phases of the ship's life cycle. The team's hope is that this model will prove a powerful tool in suicide prevention as well as benefit sailors' overall readiness and performance. ■

NHRC Officer's Journey of Service & Discovery in the U.S. Navy

By John Marciano

From the lecture halls of academia to the decks of naval ships, Lt. Matthew Peterson has embarked on an extraordinary journey of personal and professional growth as a researcher and a naval officer.

A former professor of exercise science with a PhD, Peterson entered military service open to the challenge of how his academic background would translate. Now, just a few years later, he is the recipient of Navy Medicine's Research Physiologist of the Year, and his career has been filled with travels, groundbreaking research, and opportunities to support the health and performance of service members in demanding environments.

"When I joined, I knew there was human performance research in the Navy," Peterson explained. "But I didn't realize the breadth and depth of it—or how much field experience I would gain. I've even spent time aboard ships, which is something I never expected as a researcher."

It all began in May 2019, when Peterson first reached out to a Navy recruiter. After earning his PhD from Baylor University in 2020, Peterson worked as a professor of exercise science. The opportunity to join the Navy arose in November 2021, and after completing the academic year, he shipped off to Officer Development School, aboard Naval Station Newport, Rhode Island. From supporting international operations and presenting cutting edge research, the timeline of Peterson's Navy career has been filled with many notable milestones:

In 2022, Peterson checked in to the Naval Health Research Center (NHRC) in San Diego and conducted research aboard the hospital ship USNS Comfort (T-AH 20). Just two months after checking in to NHRC, Peterson was assigned to the Command Readiness, Endurance and Watchstanding (CREW) program, and to go aboard the hospital ship USNS Comfort while deployed on a humanitarian mission to Latin America and the Caribbean.

Two NHRC research teams would be onboard conducting separate studies, a team from Operational Infectious Diseases directorate, and the CREW team from the Warfighter Performance department, both collaborating on a unique mission where shipmates wore a smart ring in order to collect biometric data for fatigue risk management and to detect early presence of illness.

"This was the CREW study team's first involvement on a hospital ship and was the longest duration of data collection within an underway environment since our research program began two years ago," explained Dr. Rachel Markwald, senior research physiologist with the Warfighter Performance Department and Principal Investigator for the CREW program.

The CREW program mission is to provide actionable, data-driven solutions that assist military leadership with the assessment and management of physiological stress, sleep loss, and fatigue in operational settings.

Then in 2023, Peterson participated in the cold-weather performance studies at the Marine Corps Mountain Warfare Training Center (MCMWTC), supported multinational exercises like Exercise Talisman Sabre in Australia, and observed Navy SEAL Hell Week in San Diego.

While at MCMWTC, Peterson and the NHRC Warfighter Performance Department have conducted a variety of studies. Standout experience is the "hypothermia lab" where students enrolled in the cold weather medicine course are immersed in a frozen pond. The team has investigated the ability to accurately triage a mass casualty event while near hypothermic, examined the effect of exercise intensity on rewarming from cold-water immersion, and assessed group cognitive abilities during this training exercise.

"While these are not heartwarming projects in the literal sense, I was impressed by the resolve and teamwork as the students and instructors in the course worked together to create a safe and effective training exercise for all involved," remarked Peterson.

In 2024, Peterson focused on nutritional studies for Explosive Ordnance Disposal candidates, presented at international conferences, and contributed to research aboard the USS Curtis Wilbur during RIMPAC 2024. Through all these experiences, Peterson has traveled across four continents, visited five countries, and conducted research in seven U.S. states, demonstrating a commitment to advancing human performance across a variety of military settings.

Reflecting on the past two years, Peterson remarked on the Navy's ability to conduct complex and dangerous training with precision and safety. "How robust our military training is and how good they are at doing dangerous things safely" has been among the most fascinating discoveries during his service.

Beyond the lab, Peterson has a deep appreciation for Navy's global impact and the close connection between research and fleet operations.

"As a researcher, I didn't realize how close I would be able to get to the fleet," he shared, citing time spent aboard ships and observing operational training as highlights.

Work in the Navy has been intellectually and administratively challenging. Writing grants and research papers, learning military protocols, and the challenge of conducting cold-weather research are just a few examples.

"I feel a sense of pride being a Naval officer and an even greater appreciation for the difficult jobs our military service members perform," Peterson said.

When asked about the future, Peterson emphasized a desire to continue finding meaning in his work.

"As long as I enjoy the work I do and find it impactful, I'll make the Navy a career. I had a grandfather and great uncle who served in the Navy around the time of the Korean War. Whether it's due to their service or other factors, I was raised to have a strong appreciation for the military," said Peterson.

Peterson's journey is a testament to the possibilities that await those who choose to serve.

"His work exemplifies the Navy's commitment to innovation, performance readiness and safety, of service members worldwide," remarked Dr. Kenneth Earhart, NHRC Chief Science Executive. ■

TRAVEL BLOG

Join SCOPE's aspiring PAO on her travels with CMC to Kansas City for Navy Week, lots of good food and fun opportunities to engage with the locals!

Story and photos by HM2 Alejandra Ramírez Alarcón

This SCOPE exclusive is not an official Navy news release or story.

Traveling is one of my favorite things to do, and while I have been to places like Bahrain, Senegal, Morocco, Abu Dhabi, Italy, and Dubai, I had never been to the Midwest.

When CMC gave me the opportunity to join him and other Navy Medicine representatives at Navy Week Kansas City, I thought we were heading to the setting for the Wizard of Oz, or where fields of sunflowers bloom. But, boy, was I wrong…

Instead, we would be representing the Hospital Corps in Kansas City, Missouri. Known for its rich jazz heritage and mouth-watering barbecue, it is a city with effortless Midwestern charm.

I was very excited to visit during my first time traveling to the Midwest. I would have the opportunity to put all the skills my Public Affairs mentors taught me along my journey to reach my dream of becoming a Navy PAO.

Our KC adventure began on a brisk Sunday morning when the leaves were beginning to change color here in Silver Spring, Maryland. Arriving at DCA was not too bad (shocker…) and being pre-TSA has its perks, so I took advantage of the time to have some breakfast at Reservoir. As a self-proclaimed foodie, I was excited to try the Kansas City barbecue, as it is known as the BBQ capital of the world, with over 100 restaurants serving up delicious smoked meats and tangy sauces. Also, as a Mexican food lover, I always make it my mission to find the best spots wherever I go.

Once we landed in KC, a local at the car rental gave us a list of the best BBQ places. My first stop, however, had to be a taco spot. I try the tacos everywhere I go, and besides having the best in Mexico City, I was really impressed with the tacos in Dubai. Kansas City might surprise me, so I headed to the east side of KC to El Rey Del Taco.

My first impression was that the KC tacos were only okay. I would give another spot a chance later in the week.

After my okay tacos, I headed to my hotel. The metro station and much of this part of town were under construction, but overall, the area was very quiet and was conveniently right next to a QuikTrip, my favorite gas station in Phoenix because they always have spicy chips and Cheetos!

In the evening, we had an all-hands call with the Navy Community Outreach Command and 13 other commands across the country, including the Navy Band Great Lakes, Naval Meteorology and Oceanography Command, Navy Talent Acquisition Group Mid-America, Maritime Expeditionary Security Squadron Two, Navy History and Heritage Command, etc. I met with CMC and the rest of the Navy Medicine all-stars in attendance for Navy Week, Capt. Shauna O'Sullivan, who attended the University of Missouri-Kansas City back in 2003, Cdr. Bryan Pyle, Capt. Alison Castro, and Hospital Corpsman 2nd Class Ryan Labita.

Kansas City morning skyline

An exhibition in honor of the first US Women's National Soccer Team

It was such a coincidence that we were briefed by my mentor, Ensign Lamar Badger, mustang and motivator, who introduced me to his former master chief from when he was enlisted, and other sailors who were also interested in commissioning as PAOs. I was grateful we were able to exchange ideas on how to improve the quality of our portfolios, talk about the things we are working on to make ourselves more competitive, and we all wished each other luck and said we would be looking for each other's on the list.

The next day was game day, and our first meet and greet with the University of Kansas City faculty and staff. We had Rear Adm. Walter Bafford and Capt. Calvin Suffridge join the Navy Medicine team representing the Dental Corps. The awesome part was that Bafford is a Missouri native, and attended the UMKC School of Dentistry. It was interesting to hear about how much things have changed since he attended school, and during the tour of the facilities, we got a glimpse of tools and techniques students are using to be the future leaders in healthcare.

After the UKC campus tour, the Navy Medicine team walked to Succotash KC to grab a bite for lunch. I ordered some eggs benedict and a delicious caramel macchiato because I cannot live without my coffee.

Afterward, we returned to the campus and met with faculty to speak about collaborative efforts in recruiting and providing students with the resources to learn about the different medical scholarships the Navy offers. We had the opportunity to meet Chief Hospital Corpsman Garcia, who was able to answer the faculty's burning questions. We each provided personal accounts of how the Navy and Navy Medicine have impacted our lives and careers. Then, it was time for the family photo!

CMC, Labita, and I had to break away early for tour at the newly constructed KC Current Stadium, the first and only stadium built for a national women's soccer league club. It was very moving to see how this women's soccer league started from playing in a minor league ballpark to having their very own field.

We toured the facility with other sailors from different commands. Our friendly and knowledgeable guide showed us the sideline club, suites, and the inside broadcasting booth, and even let us in the rooftop portion of the stadium. One of my favorite features of the stadium is that the concession stands are from popular local food spots, and that all drinkware at CPKC Stadium will be recyclable or reusable.

After the tour, we went to our hotel to change into some civvies; it was time for some BBQ. Labita had already been in KC for a few days before I arrived, and recommended Fiorella's Jack Stack Barbecue (that was also on the list from the local at the car rental.) Immediately, I loved that the restaurant was an old factory, with a rustic charm.

This was a great opportunity to catch up on how the day went and discuss the sights and plans for the rest of the week. CMC has an awesome sense of humor and is a delightful person to be around - the admin team is not ready for him to leave this upcoming fall! Labita is the nicest person and loves history; he would make an awesome tour guide.

Kansas City's Current Stadium

CMC and HM2 Labita at Jack Stacks BBQ

Once the food arrived, we dug in; I ordered some brisket and pork with a side of beans and french fries (my guilty pleasure), Jean-Gilles and Labita went with a recommendation from the waitress and ordered some burnt ends, brisket, and coleslaw. Overall, everyone was happy and full, and it was time to head back for some much-needed sleep.

The Navy Medicine team all met in the hotel lobby the next morning, and split into two different groups to visit different classes in Northern Kansas City; the unique thing about the students we were going to talk to is that they are on the healthcare track. I was excited to work with Suffridge, Pyle, and Labita because of the knowledge in their respective fields, and the plus was that we had a local hometown Kansas City recruiter join us, BM2 Smiley. I was able to pick his brain and he recommended a very specific jazz club. (More about that later)

Pyle, myself, and BM2 Smiley at Oak Park HS

My experience at STEM career days for NMRC proved to be valuable; the 11th graders were very interested in the differences in our uniforms, where we traveled, what our daily routine was like, and how we dealt with people we don't always get along with. These are all questions that I would not have even thought to ask at that age.

Our team had finished a little early that day, so I decided to take advantage of the nice weather and go on a drive around the city. I saw amazing graffiti, wall art, cathedrals, and fountains; KC is known as the city of fountains, which dates back to the late 1800s, and Rome is the only other city to have more fountains.

Later on, in the evening, CMC and I made a stop at the Negro Leagues Baseball Museum to learn about the talent, passion, and perseverance that changed Major League Baseball and America. I was particularly interested in learning more about Jackie Robinson. He famously broke Major League Baseball's color barrier in 1947 and played for the Kansas City Monarchs in the Negro Leagues before joining the Brooklyn Dodgers.

I was moved by baseball's increasing popularity with the professional Negro Leagues in the United States and the growth of professional baseball leagues in Caribbean countries and territories. Due mostly to America's military, industrial, and educational reach, Spanish-speaking regions have made baseball an essential part of life and leisure.

I think about trailblazers such as Puerto Rican Roberto Clemente, who was drafted by the Pittsburgh Pirates in 1954 and became the greatest baseball player of his time. During this period, the struggle for social justice reached every part of our country and every ballpark, no matter how talented a player was.

Jackie Robinson's Brooklyn Dodgers jersey

Nonetheless, Clemente silenced critics with his excellent bat and miraculous arm. In his 18-year career, he received every possible award given in Major League Baseball. Off the field, he built a reputation as a humanitarian with a passion for helping children through sports, and today he is as well known for his passion for helping others as he is for his passion for baseball.

Exhibit for "El Maestro" Cuban superstar Martin Dihigo

Bronze sculptures at the Negro Leagues Baseball Museum

The museum was wonderful. I'd recommend that when anyone visits KC, they immerse in the ballpark experience.

At this point it was the middle of the week, and I found myself back in the classroom, teamed up with Castro, Pyle, Labita. I loved Castro's ability to connect with the high schoolers by speaking to them in a way they would understand, and they asked us so many questions! I think it's something special nurses have in their personalities; as an HM, nurses have always been the jelly to my jam.

After the visits to the classrooms, the group agreed that we needed to pay a visit to the World War I Museum and Memorial. We arrived and walked towards the Liberty Memorial Tower. At night, a Flame of Inspiration, created by steam and lighting effects, is emitted from the top of the tower and can be seen from miles away. The monument received designation as a National Historic Landmark in 2006 and recognition from Congress as a national memorial in 2014.

I was in awe of the glass walkway with thousands of red poppies underneath, symbolizing the sacrifice of soldiers and the human cost of war. One of my favorite parts of this museum was how interactive the exhibits were and the amount of research that went into the museum's in-depth look at many aspects of the war. The films at the beginning explain how the war began, the events leading up to the U.S. involvement, and the signing of the Treaty of Versailles.

All of us were moved by the artifacts and human stories of the past. I was amazed by the medical equipment and tools that rendered aid to Sailors and Marines during that time.

After such a moving experience, it was time for the hotel and rest. However, Kansas City was growing on me, and I wanted to explore more of the city. I searched for a local BBQ spot that wouldn't be too busy; I stumbled upon Char Bar, where I met Cassidy, a local bartender who gave me BBQ and local hangout recommendations, including the Green Lady Lounge (as previously mentioned by BM2 Smiley), and the best Mexican food spot in his opinion.

Afterward, Casey offered me a sample of KC's first Hispanic-owned beer company, Rizoma. I was impressed with all the food and drink recommendations. I thanked him, and just before I was leaving, he said, "You said this was our first time in KC, but I am sure you will be back!"

The following morning, the remaining Navy Medicine team accompanied Capt. O'Sullivan to Kansas City University. O'Sullivan is a 2003 alum of the KC University's University of Health Sciences College and Osteopathic Medicine.

Navy Medicine at the National WWI Museum and Memorial

The dean and faculty staff were very kind; they gave us a tour of the university's cutting-edge Osteopathic Manipulative Medicine lab; seeing the medical students doing their hands-on work was very inspiring.

In the afternoon, after a quick lunch break, we sat down with some members of the Student Association of Military Osteopathic Physicians and Surgeons, and others who were simply curious about what the Navy had to offer. Capt. O'Sullivan shared her experiences after graduating from KCU and joining the Navy to pay for school, something that really resounded with the students. One of the most memorable moments was when CMC shared his thoughts on the bond between naval officers and senior enlisted leaders because, while yes, they are doctors, nurses, and dentists, they are naval officers and must lead their sailors.

To refuel, I invited CMC and Labita for a bite at Tacos el Gallo, the best tacos according to Cassidy. The outside of the place was very colorful, but nothing could prepare me for what was inside. Piñatas hanging everywhere! The inside was like a mini mercado with tables everywhere; I immediately smelled the carne asada and knew I was home. My favorite tacos are Al Pastor, which is pork sliced meat from a spit-grill, covered in a traditional Mexican adobada (marinade) and everywhere I go, I must try them, and these were just perfect.

Navy Medicine at Kansas City University

Tacos Al Pastor from Tacos El Gallo

There was no way we were going to be in KC and not see the Chief's stadium; unfortunately for me, the day I arrived, I wasn't able to get a ticket to watch them play the Broncos. The stadium tour was the next best thing, and let me tell you, it did not disappoint!

Our tour guide's bling

We entered the stadium through the team store. Our guide was a very knowledgeable, and a committed KC Chiefs fan. He has four Super Bowl rings with the team! We walked down a collage wall full of photos from over the decades that lead onto the dugout and onto the field. Being down in the field, I realized just how loud the stadium gets, and I understood why the stadium's design and crowd noise make it a challenging environment for opposing teams. It's a good thing the Commanders don't have to play the Chiefs here, if they want to make it to the Super Bowl.

The locker rooms were awesome, I got to sit in Patrick Mahomes' locker and I felt like a true MVP. Next, we went to the suites, and the only question I really had was where Taylor Swift was sitting.

At Chief's QB Patrick Mahomes' Locker

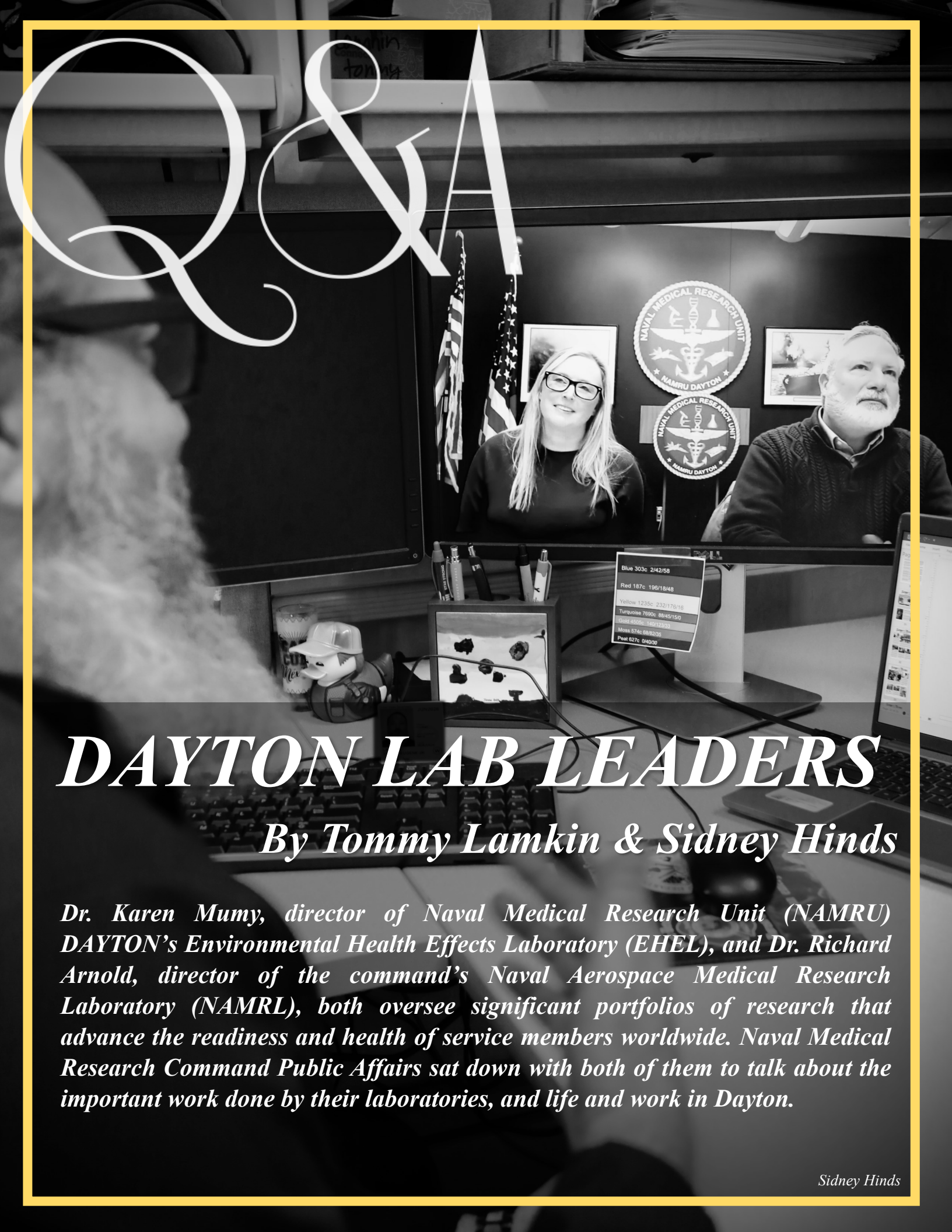
The final day, Navy Week, was the cherry on the top of the whole trip; the Navy Medicine team was joined by volunteers from the KC Rotary Club at Project C.U.R.E. in the Subtropolis, the largest underground business complex in the world. As soon as Kristen, the Executive Director, mentioned Project C.U.R.E.'s mission of sorting and distributing donated medical supplies, equipment, and services to healthcare professionals in more than 135 countries, we were all sold!

We went on a quick tour of the facility, met with arriving Rotary Club volunteers, and got to work sorting supplies for a shipment to Ethiopia. Some of the volunteers mentioned seeing the Navy on the local news and were happy to have us in KC.

This would be my last night in KC, and honestly, I was a little bummed. I took advantage of my last night to appreciate the local fountains and wall art and grab a bit at Joe's KC BBQ. I finally made it to the Green Lady Lounge. The June Bug was my favorite drink, and their charcuterie trays were delicious; honestly, you cannot go wrong with any of the mules. Overall, I loved the speakeasy vibe, free of televisions, just rich traditional live jazz.

KC, indeed, I will see you again. ■

Live jazz at the Green Lady Lounge



DAYTON LAB LEADERS

By Tommy Lamkin & Sidney Hinds

Dr. Karen Mumy, director of Naval Medical Research Unit (NAMRU) DAYTON's Environmental Health Effects Laboratory (EHEL), and Dr. Richard Arnold, director of the command's Naval Aerospace Medical Research Laboratory (NAMRL), both oversee significant portfolios of research that advance the readiness and health of service members worldwide. Naval Medical Research Command Public Affairs sat down with both of them to talk about the important work done by their laboratories, and life and work in Dayton.

Sidney Hinds

Editor's Note: *Content from this Q&A has been edited for brevity and clarity.*

Tommy Lamkin: *Tell us a bit about yourselves. What's your background? How did you find Navy medicine?*

Dr. Karen Mumy: I'm the science director for the Environmental Health Effects Lab (EHEL) here at Naval Medical Research Unit DAYTON. I did my undergraduate at Michigan Tech University, where I got a Bachelors of Science in biology. I went on to graduate school directly from undergrad and received a doctorate in microbiology from Miami University.

After that I moved out to Boston for about five years and I worked at Harvard Medical School and Massachusetts General Hospital, in a mucosal immunology lab doing pathogen research. It was similar to the research that we do here at the environmental health effects lab, where we're looking at health effects associated with operational and occupational exposures that warfighters may experience.

I always have to do the math, but at this point it's been 15 and a half years. I started with EHEL when it was still a detachment, prior to the command standing up. I started as a contractor and then became a GS bench researcher. Then, I think in 2012 or so, I became the deputy director for the Directorate and then in 2017 became the director. The way that I came to work for the Navy and Navy medicine is not that impressive necessarily; I applied

Zack Wilson

for a job that was posted on the Internet.

TL: *I've got to tell you, I think that is impressive. You were a contractor and now you're a director.*

KM: I guess it just goes to show you, you stick it out and you can work your way up, I suppose, yeah.

TL: *Has the EHEL always been at Wright-Patterson?*

KM: EHEL originated in 1959 as the Navy toxicology unit in Bethesda, Maryland, and moved to Wright-Patterson Air Force Base in 1976 to co-locate with the Air Force's Toxic Hazards division, though they're no longer in existence. That's one question we get a lot of like, why is the Navy in Ohio? Where's your water? We're not even by Lake Erie, frankly.

Dr. Richard Arnold: I'm from the DC area originally. My educational background is in psychology from the College of Charleston, South Carolina and my PhD in differential psychology and behavioral genetics from the University of Texas.

I entered the Navy out of Graduate School as a commissioned officer. I was an aerospace experimental psychologist MSC officer, which we have a few of in the enterprise. I did a short stint in the Navy, got out, and started my own consulting firm doing human factors and aerospace medicine research and consultation, and ended up getting some jobs with NAMRL, when it was still in Pensacola.

There was increasingly more work with NAMRL, to the point where they started trying to sell me on just moving over, and after a period of that, they convinced me. I went to NAMRL in March of 2008 as a researcher; I was a principal investigator, which only lasted about a year, then I was appointed as a special advisor to the commander for scientific programs. That catapulted me eventually into the scientific director position in 2010.

So, I was the scientific director of NAMRL in Pensacola about a year before the Base Realignment and Closure happened. I moved with the lab, with only eight people. In the past 14 years we've built up from that seed to about 90 people today.

TL: *Was there any reluctance to leave warm Pensacola to come to Dayton, Ohio, where you've got snow on the ground?*

RA: I do like Pensacola, particularly this week when we're still under a foot of snow and single digit temperatures, but not really. I went in with eyes open. I was all in. One of the nice things about BRAC is the new facility, new capabilities and then co-location with the Air Force. On the Air Force side, Wright-Patt is the center of the research universe. They have everything consolidated. The part of Air Force Research Laboratory (AFRL) that does similar work to ours is here. This is as far north as I've ever lived, and I'm still not a fan of winter, but weather aside, everything about it is great.

Not everyone was similarly convinced. As I mentioned earlier, only eight people came, including me, and most of the eight are gone now as well. At least two of them moved back to Pensacola after a few years here. It's not everyone's cup of tea, but I'm pleased with it.

TL: *What do your directorates do? How do you work towards the betterment of service member health? What is the payoff for work done by your respective laboratories?*

RA: NAMRL is a directorate of NAMRU DAYTON now, but when it was a standalone lab in Pensacola, it was the Navy's designated aerospace medicine research command. Now as a lab under NAMRU-D we still retain that distinction, though we work a bit harder to keep in the forefront of our stakeholders' minds. Naval Medical Research Unit is a fairly generic name, which is why it was so great about 8 or 9 years ago when our then-CO restored the old NAMRL and EHEL names to the command's research directorates. The tradition is nice, but even more importantly the descriptive legacy lab names help in our efforts at brand recognition among our fleet stakeholders.

The military is not completely unique in this regard, but close, in the sense that aerospace medicine as a subspecialty in medicine is very military-aviation-centric. It is a board-certified specialty, though,. To my knowledge, there are only five residency programs in the U.S.. Three of them are in the military. The U.S. Navy, Air Force and Army each have one. NAMRL was stood up in 1939, though not by that name. It was a research department under the School of Aviation Medicine in Pensacola and has been the research arm of aerospace medicine for the Navy since that date.

One area we work in is aeromedical standards to qualify to be aircrew or a pilot; there are stringent physical exam standards. You have a setting of standards or revising of medical standards for qualification. The majority of work done here is operational, for example applied physiology in aerospace environments, the effect of altitude or pressure physiology, health, and performance, the effect of unusual acceleration so high Gs [referring to increased gravitational force acting on pilots in the aerospace environment], etc.

Jet fighters pulling Gs can lead to disorientation, because now it feels like down is somewhere other than actual down 'cause you're pulling the gravitational vector at an angle as a result of pulling Gs. This leads to a lot of aircraft mishaps. We do a lot of work on acceleration, a lot of work on altitude. Sensory systems of vision and vestibular being two of the chief aspects thereof.

We look at performance as well; not just health consequences of these unusual aerospace environments, but readiness and performance. There are still health problems that result from operating in aerospace environments: there's performance, there's safety issues. A lot of mishaps and these are not just the cost of the lost lives, but tend to be very expensive in terms of material as well. This is where NAMRL's mission sits within the Navy. We do a lot of joint work as well, especially with the Defense Health Agency (DHA), taking on a larger and larger role sponsoring joint medical research. We do a lot of joint work with Army and Air Force. Their problems are similar. They fly jets. They fly helicopters.

TL: *So a quick follow-up: as technology and equipment advance, does your role change? Are you are you helping technology advance? For example, when the F-35 come out, that's certainly a lot different in terms of capability.*

RA: The F-35 is a great example. It uses an integrated helmet, and a lot of the avionics are now displayed on the helmet. They can't be flown without the helmet, but there are there are challenges related to that. One thing about F-35 is that it is very, very cognitively demanding. I talked to an Air Force pilot who had transitioned from the F-16 to the F-35, and he said it's night and day in terms of the mental workload required to operate with the integrated helmets in such a complex and capable aircraft. So, some research we're doing is on the way they designed the helmet. You get altitude displays when you're looking forward; as they say colloquially 'on boresight,' you're looking straight down the nose of the aircraft. A lot of those displays drop off and you only get minimal information when you're looking 'off bore', and we've done research to determine what should be included when they're looking off. It would be confusing, right? Because the aircraft is displaying its own orientation. But if you're looking to the side, it's easy to get confused. Is that your orientation? That's still the aircraft's orientation. I think that's the reason some of it was stripped down, but we've done a series of studies in collaboration with the Air Force here at Wright-Patt, to improve performance and spatial awareness. That work is still ongoing, but that's really exciting and promising. Even though we've been doing this since 1939, new problems such as this constantly emerge within our problem space.

We're able to research and mitigate new problems as well. We have active research in cyber sickness. In training for naval aviation, just as in a lot of the world, we use virtual reality and augmented reality. A lot of what had been done in larger fixed base flight simulators is now being done in mixed reality types of environments, and as you may know, it can be pretty unsettling. You can get simulator sickness quite easily and it's no good. This is a problem now in training; a new problem that has emerged in Naval aviation flight training as a result of this training modality. So we've got a growing program of research and ways to understand why it's occurring and find ways to mitigate it.

KM: EHEL is a directorate at NAMRU DAYTON, same as NAMRL. We look at all the environments that service members operate in. It's our job to assess whether different environmental exposures result in various health effects. Those environmental exposures could be anything, and a lot of them are focused around chemical exposures; not chemical warfare agents or anything like that, but some of your more typical everyday -type exposures, things like jet fuels and hydraulic fluids that are not necessarily at the forefront of our minds when somebody is doing their job.

But if you're exposed to these oils and these coolants, day after day, many hours a day, then over time they have various health effects, whether that's a cognitive effect or effect on the respiratory system. Those types of effects can certainly have an impact in the moment on being able to execute a mission, but then also over the long term, it can contribute to retention issues within the military too, if somebody becomes ill from lung disease or something along those lines.

We're looking at those types of exposures. Things like pesticides. But we also look at other stressors that the environment presents, and that can include things like altitude, extreme temperature, vibration or noise. Noise is a huge issue in military environments. We have a lot of active research looking at noise exposure alone, but also in combination with chemical exposures, because there are types of chemicals that are known to impact hearing from high levels of exposure.

TL: *I can definitely relate to that. I'm a surface Navy guy, and I lived on ships for a long time, and there can be a lot of exposures.*

KM: Yeah.

TL: *Is there an onboard component to your work? Almost every sailor on the ship is doing maintenance of some kind, usually around hazmat or some type of compound? Look at AFFF [aqueous film forming foam, an expanding foam used to fight fires. The U.S. Navy began phasing out AFFF in 2020] for example and the potential exposure risks.*

KM: We don't see a lot of field operations necessarily, but we are in contact with a lot of Fleet members: industrial hygienists, different safety engineers in the Navy, Marine Corps and Public Health Command. We're able to keep our finger on the pulse of the concerns with exposures. You mentioned AFFF; that's another perfect example of something that was put into use without fully understanding all the repercussions of what could happen. In a perfect world, we'd get ahead of that, right? We'd be able to get an idea for how safe or unsafe something is, and know what the safe level of exposure or where we expect issues or problems to start to occur. In a perfect world, we'd be able to do all that before it's actually in use. Nonetheless, the idea is to still figure these things out before something is in use for 30, 40, 50-60 years.

TL: *If they were looking at a replacement for the AFFF, would you be involved in that discussion?*

KM: Yeah. We are involved in some of those discussions, particularly with regard to some of the alternatives to the PFAS [Per- and polyfluoroalkyl substances—synthetic compounds often used in products that are heat or water resistant], which are the active components in firefighting foams, and do the heavy lifting of fire suppression. We are involved in those discussions where they're looking at alternatives to those types of chemicals, yeah.

TL: *What is going on right now inside your directorates that makes you most excited? The projects that you think about when you're drinking your morning coffee, and get you fired up?*

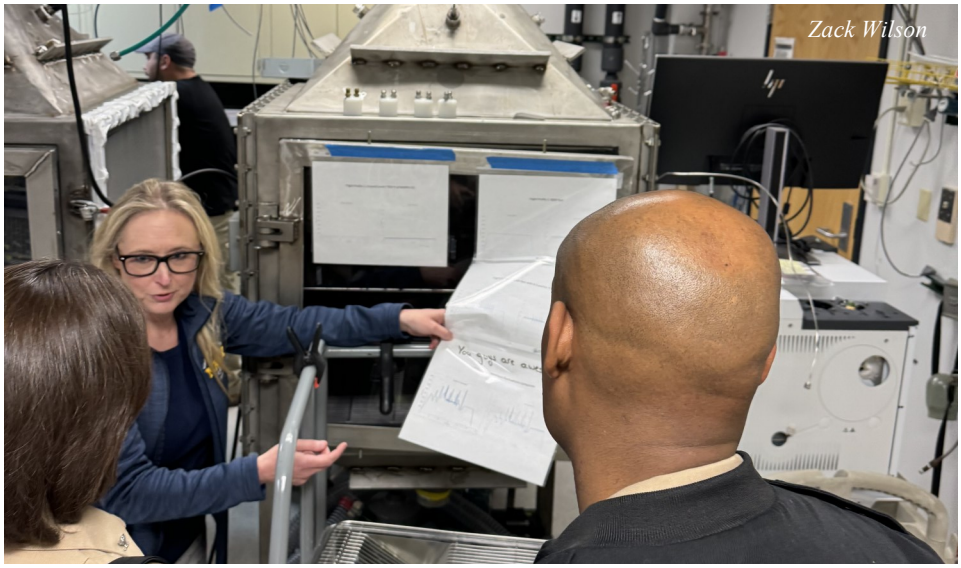
RA: NAMRL is about three years into a five-year agreement with NASA's Johnson Space Center to do research to inform Artemis programs and problems related to Artemis. They'll be landing on the moon, which they'd done previously with Apollo, where there were issues with spatial disorientation; Neil Armstrong said he was extremely disoriented, coming in just because of the angle of attack. With the Artemis Moon landing, they're going to be landing on the lunar south pole where you can have really long shadows, potentially exacerbating that disorientation. What they'd like to do is once we get the test bed mature to do the research is actually send the Artemis astronauts as research subjects through the Kraken, our simulation machine. We've already configured a simulation so the capsule of the Kraken simulates a lunar lander. Once we get a bit closer in development, we'll be having Artemis astronauts coming through as research participants as they prepare for their actual lunar mission. So that's pretty exciting, and it kind of harkens back to NAMRL involvement in the space program dating back to the late 50s, to Mercury and Gemini and Apollo programs and a lot of the those astronauts came through the lab in Pensacola and did space motion sickness desensitization, unusual acceleration desensitization training, among other things.

Zack Wilson

We've had feel-good stories while we worked over an eight-year period in the reimbursable environment. It's hard to sustain research for that period of time, because you have to find multiple sponsors to continue to mature the technology. But we successfully did that with some low-intensity threat laser eye protection that we worked on with Air Force Research lab Materials and Manufacturing Directorate to provide a solution to the U.S. Coast Guard. The Coast Guard has been fielding these spectacles in every Coast Guard aircraft over the past couple of years, so that's one of those feel-good story transitions where you do a lot of the work, and down the road it sees its way to operational use.

We have at least one more in the works like that; there's a device used throughout the militaries of the world, now called the reduced oxygen breathing device, or the ROBD, that NAMRL developed when we were still in Pensacola. It provides for air crew hypoxia familiarization training, so they can experience a hypoxic event as they might experience in flight, so they'll know what it feels like so they can recognize it if they have an inflight emergency.

That tech was developed at NAMRL, and then we did a tech transition to a commercial firm. So it's now sold by this commercial firm, but it does have some limitations. It can only do a limited range of oxygen concentrations or gas mixes overall, and it has a fixed flow pressure. Some research engineers here at NAMRL over the past four to five years have developed a new device called the HVRD hypoxia ventilatory research device that corrects for all of those limitations, does any gas mix you can imagine, and can be programmed to flow and pressure in line. It's capable of replicating the breathing systems in any DoD jet, and opens a wide range of research opportunities and new training opportunities if there's interest in the fleet, as they are currently using ROBD. That patent was filed a year and a half, two years ago, and we're just waiting for final award of the patent and then we'll begin the tech transfer process. We want to get this out and available for wider use.


Zack Wilson

I could probably go for another hour but those are a couple I'm excited for.

TL: *I know that Dayton gets quite a few visitors. When they come through, are you putting them in the Kraken?*

RA: (laughs) Yeah, almost never in the Kraken, though I won't say it's never happened. It depends on how big the V and the I and the P are, and on availability. There's almost no room in the schedule; it's either being maintained or it's being used. We have a long list of research projects and it's a bit of a production to get somebody in there. But I won't say that we never have. I've only been in it once, and I'm the director.

TL: *And how was that?*

RA: It was super cool. I flew a Boeing 777-type of setup in the cockpit, so it was pretty benign motion-wise, which was to my liking.

KM: On the EHEL side, I get excited about the research that we're doing with hearing-related injury, because that is a huge issue for service members, not only in their ability to do their jobs, but also in their ability to stay in the service. It has a huge impact on retention, and we're looking at different types of exposures that could impact hearing -related injury that have never been looked at before; certain things like impact, and long-duration noise that are relevant to the military operational environment; things are not always looked at when it comes to public health.

Another aspect I'm very excited about has to do with broadening research when it comes to warfighters and military members. For decades we were primarily only looking at men, so all of your safety standards, your exposure guidelines, all of that is set primarily with only men in mind. With more females in active duty and in the reserves, we have a number of projects where we're looking at differences in exposures. That's a huge advancement when it comes to science all around.

TL: *Do you think medical research helps advance integration? For example, we're now looking at about 30 years for women on ships and 10 years on submarines, maybe about the same for special warfare. Is there medical research that's helping the integration or is it kind of after the fact? The submarine study that happened about 12 years ago looking at reproductive health, for example.*

KM: I'd say we are in a situation where we're doing a lot of backtracking, because a lot of the work done over the decades considered males only, but now some of that has to be redone to an extent to include women. Women onboard submarines is a perfect example of that; some of the research is backtracking, but we're going to do a better job going forward. Women are just in general being more included when it comes to medical and clinical research.

TL: *During the last Military Health System Research Symposium, I was talking to one of our researchers, and we were discussing how now that the number of women on submarines has grown, they can do these years-long longitudinal studies they hadn't been able to do because they have more than just a handful on each boat.*

KM: Yeah, absolutely.

TL: *And hearing conservation is vitally important. I've got hearing problems. I think most veterans do. I've been on flight deck, and I was there for the F-35. Are there efforts keep up with new, louder technology?*

KM: That's a that's a good question. There are different products and different materials that you can look at for hearing protection, some of which would do a better job. The problem is that there's always a tradeoff between being able to protect your hearing from noise and being able to communicate with everybody else. I think where there has been a change has been in awareness. The services are more aware of the risks, and more likely to comply with the protection than maybe they would have been decades ago.

TL: *Well, I definitely believe that; I mean my first ship, we would go down to the engine room with nothing. And on my last ship you would get your face screamed off if you went in there without foamies and the Mickey Mouse [over the head] ears.*

KM: Yeah, absolutely. Some of what we do with our research is provide education and knowledge, which is very powerful. Hearing conservation is a great example of that.

TL: *I'm sure there's collaboration with other Navy offices, like Navy Safety Center, among others. So you're giving them the tools to take to the fleet?*

RA: Yeah, if you recall, the physiologic episode crisis really exploded across the DoD in about 2017, and ran through, I guess in earnest, maybe 2021, but Air Force, Navy, Marine Corps and anyone who flew tactical jets with a pressurized cockpit and a breathing system life support system were reporting this high incidence of what they called unexplained physiologic episodes or physiologic events, where they just felt something was wrong. They couldn't pinpoint what or why.

There were a lot of hypotheses, like that something was wrong with the on-board oxygen generating system that was leading to chemical contamination of the breathing air, or maybe that something was wrong with the breathing system that was providing insufficient oxygen.

The Navy first established what they called a PEAT Physiologic episodes action team. They created a new one-star admiral position responsible for coordinating the Navy -wide response, and a big piece of that was research. NAMRU Dayton, both NAMRL and EHEL, were involved in the research response to the physiologic episodes. There were congressional hearings, and New York Times articles on this. It was very high visibility and these two admirals in turn had to go testify to Congress.

In 2017, they thought it was chemical contamination, and EHEL was able to collect samples. We analyzed them and Doctor Mumy herself led the charge to characterize how many hundreds of chemical compounds could be involved and was able to eliminate that as a possibility. EHEL actually played the largest role in ruling out chemical contamination as the cause within the first year. Then the focus turned to breathing systems and inadequate supply or cockpit pressurization and turned out to play a role from time to time, though I don't think there's really a single smoking gun. NAMRL was also involved in the latter questions of pressure, and on breathing systems and flight mask functionality and the functionality of the inspiratory and expiratory valves, which open and close as you breathe, and there's a role there, potentially.

As a result, the manufacturer of most military flight mask made a design modification to mitigate some of the mechanical issues with the flight mask and all of this was done with the PEAT and with the Naval Safety Command.

TL: *It sounds like there's a lot of collaboration and unison between the two directorates.*

KM: Our missions are quite different, but we do try to collaborate, just like we do with the other labs in the enterprise, wherever it makes sense.

TL: *On a lighter-hearted note, you know how do both of you like Dayton?*

RA: Ask me in the spring (LAUGHS) No, it's a nice place; there's lots to do. I lived in the South my whole life, so I still have a hard time with the winters, and don't think that's ever going to change, but it's a good place. You can't beat the traffic.

KM: Yes, especially compared to what we dealt with before. You know, I lived in Boston!

TL: *Here's the important question. We've got Michigan over here, and we've got the DC area native over here. Who's winning on Saturday night, [Jan. 18] Detroit or Washington?*

RA: Washington, of course.

KM: I mean, I don't know. I wouldn't rule out the Lions. ■

LOOKING Aft

with André B. Sobocinski

Historian, Bureau of Medicine and Surgery

Navy Medicine's First Scientific Specialty

Not unlike the Dr. Stephen Maturin character in Patrick O'Brien's novels, the U.S. Navy's first medical officers were products of the Enlightenment and explorers of the natural world. In addition to medical topography, early reports by ship surgeons often contained observations on climatology, zoology, geology, and especially botany. It is little surprise that botany, one of the oldest natural sciences, was also one of the first scientific specialties in Navy Medicine. As most medicines used by ship surgeons in the eighteenth and nineteenth centuries were plant-based, the first Navy physicians needed a working knowledge of botany and materia medica. Two Navy physicians, however, William P.C. Barton (1786-1856) and William Baldwin (1779-1819) went far beyond this basic requirement to make significant contributions to the field. In doing so, each helped pioneer a proud tradition of science in Navy Medicine that continues to this day.

William Barton

William Baldwin

Dr. William Paul Crillon Barton was born into a prominent Pennsylvania family that included his father, William Barton (1754-1817), the designer of the Great Seal of the United States; his brother, John Rhea Barton (1794-1871), a pioneering orthopedic surgeon and namesake of "Barton's fracture"; and his uncle, the preeminent botanist and naturalist Dr. Benjamin Smith Barton (1766-1815), one of the first professors of natural history in the United States. His uncle helped establish an academic tradition for botany at the University of Pennsylvania and later tutored Meriwether Lewis on the uses of plants for medicine and food before Lewis's expedition into the unexplored Louisiana Territory in 1804. This familial connection clearly influenced the younger Barton's path.

Like many young physicians of the time seeking adventure and honor, Dr. W.P.C. Barton chose a career in the U.S. Navy, obtaining a commission in 1809. In his lengthy career—which extended until his death in 1856—Barton made significant contributions to naval health and administration. He helped keep scurvy at bay by introducing a citrus ration to the U.S. fleet, published the first writings on hospital administration in the military, helped prohibit alcohol rations aboard Navy ships, and served as the first chief of the Bureau of Medicine and Surgery (1842-1844).

While on active duty, Barton also served as professor of botany at the University of Pennsylvania and at Thomas Jefferson Medical College, demonstrating his commitment to both practical medicine and academic pursuits.

Through his first decades of naval service, we would also Barton compile several compendiums of American plants including Flora Philadelphiae Prodromus (1815), Vegetable Materia Medica of the United States (2 volumes, 1817-1825) and Flora of North America (1821-1823); each would be considered standards of botanical science

Fellow Navy surgeon William Baldwin was a student of Barton's uncle and the renowned botanist William Bartram. A native of Newlin, Pennsylvania, Baldwin was

Bartonia Superba from drawings of W.P.C. Barton, 1821

commissioned in the Navy in 1812, serving first as medical officer for a gunboat flotilla based in St. Mary's and later in Savannah, Georgia. Following the War of 1812, Baldwin traveled through eastern Georgia and Florida, collecting botanical specimens and writing detailed descriptions of local flora that would be used by botanist Stephen Elliott in his Sketch of the Botany of South Carolina and Georgia (1821). In 1817, Baldwin was selected to serve as medical officer aboard USS Congress on its mission to support the Venezuelan War of Independence, in part to conduct field expeditions and investigations on sustainable vegetable production in South America. Despite suffering from pulmonary tuberculosis, Baldwin was selected by the Secretary of War to be part of Major Stephen Long's expedition to the Rocky Mountains in 1819. Tragically, he died of respiratory failure during the expedition that same year, cutting short a promising career.

Although his life and thus his published work were not as extensive as Barton's, Baldwin's botanical observations were published in the Journal of American Science (1818) and posthumously in Transactions of the American Philosophical Society (1825). The thousands of specimens he collected were distributed to various herbaria and museums throughout the country and used for study. The high regard for Baldwin's work among fellow botanists is evidenced by the plant genus Balduina and the Baldwin Herbarium in Philadelphia, Pennsylvania, which were named in his honor. In a biography of Baldwin, the American physician and politician Dr. William Darlington wrote, "His rare industry and sagacity entitled him to take rank with the most deserving of our pioneers in the field of American botany."

Barton and Baldwin exemplified the spirit of scientific inquiry within early Navy Medicine. Barton's extensive publications and administrative contributions solidified his place as a leading figure in American botany and as a Navy Medicine trailblazer. Baldwin's dedicated fieldwork and meticulous observations, though tragically cut short, left a lasting legacy recognized by his contemporaries and preserved through his collected specimens and the honors bestowed upon him. These two individuals—representatives of the beginning of Navy Medicine—not only advanced the field of natural history, but it is no understatement to say that they help sow the first seeds of scientific thought into the service. ■

Sources:: Harshberger, J. W. (1899). The Botanists of Philadelphia and Their Work. Philadelphia, PA: Davis and Sons.

Pleadwell, F.L. (1920). William Paul Crillon Barton, Surgeon, United States Navy, A Pioneer in American Naval Medicine (1786-1856). Annals of Medical History. Paul B. Hoeber, Inc., New York.

Gentiano Saponaria from drawings of W.P.C. Barton, 1821

CHARM

The Lancet article featuring the CHARM 2.0 findings was also featured on the infectious disease- focused podcast, "This Week in Virology", episode 1162. The weekly podcast series host, Dr. Daniel Griffin, an infectious disease specialist from Columbia University, Irving Medical Center, discussed updates in clinical virology which included a brief review and discussion about CHARM 2.0.

"Being highlighted on the podcast demonstrates how military medical research is of interest and value to civilian public health," said Capt. Andrew Letizia, science director for NAMRU INDO PACIFIC. "It is fulfilling to hear how our work can inform civilian providers such as those who listen to the podcast on the effects of long COVID."

The podcast reported how the CHARM 2.0 study demonstrated the lingering effects of COVID-19 on Marines by describing physical and mental symptoms, as well as decreased physical fitness test performance, even after very mild initial infection. During the discussion, the podcast mentioned that because of their PASC, a quarter of these Marines are not able to keep up with the healthier Marines if they get into a bad situation, and as Griffin stated, "That's not okay!"

"Publication of the CHARM 2.0 study in the Lancet Regional Health – The Americas and the results being summarized on the podcast 'This Week in Virology' highlights the important contributions of the Naval Medical Research Command to the scientific community," added Porter. "These results in particular demonstrate the value of rapidly establishing a well-defined cohort of Marines at the height of the COVID-19 pandemic enabling long -term follow-up for potential chronic adverse health outcomes."■

Ahnen

"NSMRL, SUBASE New London, and southeastern Connecticut are better with John Ahnen, and we are proud to have him as a part of our team," Deflice added.

"I'm extremely proud of the work I've done here at NSMRL," said Ahnen, "but I want to specify that everything I accomplish is owed to my amazing team. It's like being the conductor of an orchestra. Everyone knows their parts, so all I have to do is give them a little direction. It's truly an honor to take part in what we do here to create a safer working environment for our fellow military members."

Each month, the Chamber shows their appreciation for the military community by recognizing exceptional active-duty service members from different branches of the military, who are in turn hosted by local community organizations. For the month of November, a celebratory luncheon was hosted by the New London Rotary Club at the Lighthouse Inn in New London.

"It's been a privilege getting to learn about these honorees who work so closely with the Chamber's roots in New London and surrounding eastern Connecticut areas," said Julia Florence, communications manager for the Chamber of Commerce of Eastern Connecticut. "It is important to recognize these service members for not just their exemplary military conduct but dedication to civic engagement and volunteerism; they play dual roles in society and have great impact on our region."

Ahnen spends much of his off-duty time volunteering at community events, from career days and social events at local schools to cleaning up local roads and handing out holiday donations with local charities. Additionally, Ahnen serves as a Sexual Assault Prevention and Response Victim Advocate for Submarine Base New London, supporting victims during very challenging times.

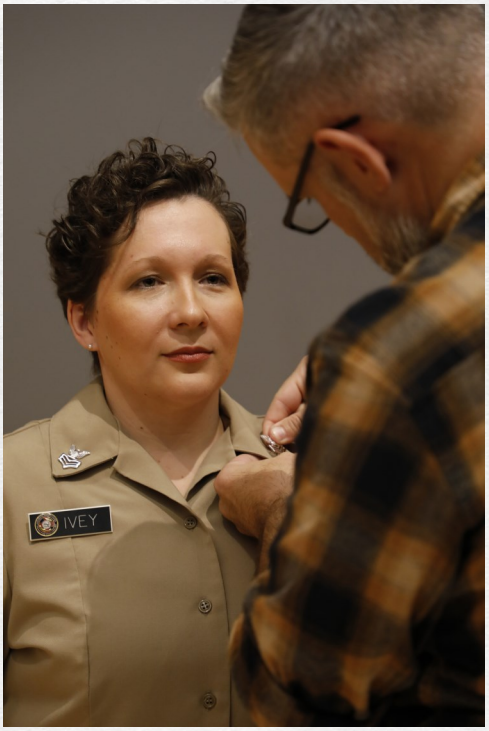
"My mom always taught my brother and I that if you were in a position to help, you shouldn't hesitate," said Ahnen. "Whether it's picking up trash, stopping on the side of the road to change a tire, or mentoring children, we should all strive to be the helper, because one day it might be you who needs that help." ■

Scope News

A closer look at Navy Medicine Research & Development

BANGKOK (Dec. 9, 2024) Capt. Nicholas Martin (right), commanding officer, Naval Medical Research Unit (NAMRU) INDO PACIFIC, and Col. Matthew Levine, director, Walter Reed Army Institute of Research-Armed Forces Research Institute of Medical Sciences (WRAIR-AFRIMS) discuss ongoing research work during an annual meeting. — *Courtesy photo*

KANSAS CITY, Mo. (Nov. 13, 2024) Master Chief Hospital Corpsman Phillip Jean-Gilles, command master chief for Naval Medical Research Command (NMRC) and Navy Medicine representative, speak to an 11th grade class at North Kansas City High School on the healthcare track during Navy Week Kansas City. Since 2005, America's Navy has come home to up to 15 cities across the country every year. — *HM2 Alejandra Ramirez Alarcon*

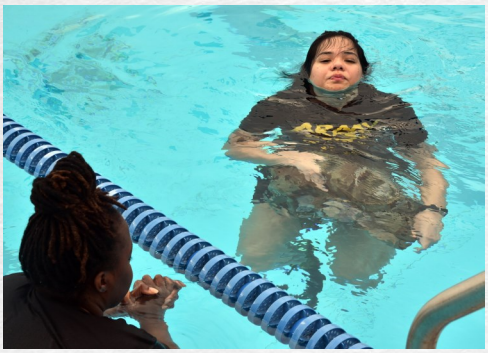


◀SILVER SPRING, Md. (Dec. 10, 2024) Hospital Corpsman 1st Class Bethany Ivey, Naval Medical Research Command's (NMRC) Sailor of the Year, is pinned to her new rank by her husband Eric Ivey during an all-hands call and ceremony. — *Tommy Lamkin*

▶SIGONELLA, Italy (Nov. 22, 2024) Hospital Corpsman 1st Class Kirk Ashley Young, with Naval Medical Research Unit (NAMRU) EURAFCENT and the Navy Medicine Research & Development (NMR&D) 2024 Sailor of the Year, poses for a photo aboard Naval Air Station Sigonella. — *Greta Ruffino*

Scope News

A closer look at Navy Medicine Research & Development



SAN ANTONIO (Dec. 3, 2024) U.S. Army Sergeant Gabriela Saldana, assigned to Naval Medical Research Unit (NAMRU) San Antonio's Research Services Directorate (RSD), participated in the annual Solider, Non-Commissioned Officer (NCO) and Officer of the Year Competition hosted by Public Health Command, West. Saldana, of Austin, Texas, earned NCO of the Year for NAMRU-SA. — *Burrell Parmer*

SAN ANTONIO (Dec. 10, 2024) Dr. John Simecek, director, Craniofacial Health and Restorative Medicine, Naval Medical Research Unit (NAMRU) San Antonio, briefs his directorate's capability to Dr. Sean Biggerstaff, principal deputy director, and Matt Gray, deputy director, Research and Engineering Directorate, Defense Health Agency at the Battlefield Health and Trauma Research Institute — *Burrell Parmer*

SAN DIEGO (Nov. 20, 2024) The Naval Health Research Center (NHRC) restarted the NHRC Research Day to share the research many do from across the command with the intent to broaden perspectives, gain an appreciation for the bigger NHRC mission, and to foster internal collaborations. Participation included a total of 40 research posters and 5 presentations. Awards were presented for: Audience Choice Poster, 1st, 2nd, and 3rd Place Posters, Early Career Poster, Best Presentation of Poster, Best Visual Poster, and Best Oral Presentation. — *Danielle Cazarez*

SILVER SPRING, Md. (Dec. 12, 2024) Cmdr. Mark Simons, with NMRC discusses research efforts with Rear Adm. Matthew Case, acting assistant director, Defense Health Agency (DHA), Healthcare Administration; and director, Naval Medical Service Corps, during a tour of the command's headquarters and laboratories. — *Tommy Lamkin*

CAIRO (Dec. 10, 2024) Staff with Naval Medical Research Unit (NAMRU) EURAFCENT attend the command's 2024 Strategic Planning Meeting. The annual meeting is an opportunity for leadership in science, administration, and finance to discuss and establish the future research goals of the command. — *Sossina Tafari*

Scope News

A closer look at Navy Medicine Research & Development

SILVER SPRING, Md. (Dec. 9, 2024) Scientists and staff with Naval Medical Research Command (NMRC) present ongoing Navy Medicine efforts during a visit by partners from Vietnam's 108 Military Central Hospital. Navy Medicine Research & Development, led by NMRC, conducts a broad suite of research alongside Vietnamese partners, through its Naval Medical Research Unit (NAMRU) INDO PACIFIC command. — *Mike Wilson*

BETHESDA, Md. (Nov. 21, 2024) Lindsey White, a clinical research coordinator with Naval Medical Research Command's (NMRC) Clinical Trial Center (CTC) prepares a syringe for injection. NMRC's CTC is conducting a phase 1 clinical trial for a Staphylococcus aureus vaccine, aimed at reducing frequency and severity of infections caused by Staph aureus, a leading cause of skin and soft tissue infections. — *Tommy Lamkin*

DAYTON, Ohio (Oct. 10, 2024) Naval Medical Research Unit (NAMRU) Dayton celebrated the Navy's birthday with a cake-cutting event. — *Zach Wilson*

▲▶SAN DIEGO (Nov. 7, 2024) Researchers from Naval Health Research Center (NHRC) engage with local STEM students with interactive displays and activities during Fleet Week San Diego at the innovation center in Broadway Pier. — *Danielle Cazarez*

Scope News

A closer look at Navy Medicine Research & Development

GROTON, Conn. (Dec. 9, 2024) Dr. David Fothergill, science director, Naval Submarine Medical Research Laboratory (NSMRL) shows Naval Medical research Command (NMRC) leadership NSMRL's hyperbaric chamber room. —*Emily Swedlund*

FORT LAUDERDALE, Fla. (Dec. 5, 2024) Members of NMRC's Biological Defense Research Directorate attend the 2024 Defense Threat Reduction Agency , Chemical and Biological Defense Science and Technology Conference. — *Courtesy Photo*

HOUSTON (Dec. 12, 2024) NSMRL researchers visited the National Aeronautical and Space Administration (NASA) at Johnson Space Center. — *Courtesy Photo*

NASHVILLE, Tenn (Nov. 04, 2024) NAMRU SOUTH veterinary staff participate in the 75th National Meeting of the American Association for Laboratory Animal Science. — *Courtesy Photo*

SCOPE

MAGAZINE OF NAVY MEDICINE RESEARCH AND DEVELOPMENT